

NELSON CITY COUNCIL

**Nelson Air Quality Plan**

Proposed Plan Change A2  
Alignment with NES for Air Quality

**Section 32 Report**

September 2011



## **1.0 Introduction**

### **1.1 Purpose of report**

Section 32 of the Resource Management Act (RMA) requires Council to consider alternatives and assess the benefits and costs of adopting any objective, policy, rule or method in a plan or policy statement prepared under the RMA. Before publicly notifying a proposed Plan Change, the Council is required to prepare a Section 32 report summarising these considerations.

Section 32(3A) applies specifically to national environmental standards (NES). When a rule in a plan imposes greater restrictions on an activity than does the NES, consideration is needed of whether that additional restriction is justified.

The purpose of this report is to fulfil these Section 32 requirements for Proposed Plan Change A2 to the Nelson Air Quality Plan.

### **1.2 Steps followed in undertaking the Section 32 evaluation**

The 6 broad steps which this section 32 evaluation follows are:

1. evaluating the extent to which any objective is the most appropriate way to achieve the purpose of the RMA
2. identifying alternative policies and methods of achieving the objective
3. assessing the effectiveness of alternative policies and methods
4. assessing the benefits and costs of the proposed and alternative policies, rules, or other methods
5. examining the risk of acting or not acting if there is uncertain or insufficient information about the subject matter of the policies, rules, or other methods
6. deciding which method or methods are the most appropriate given their likely effectiveness and their likely cost, relative to the benefit that they would be likely to deliver

### **1.3 Description of Proposed Changes**

This proposed Plan Change is to recognise changes made by the Government to the National Environmental Standards for Air Quality (NES)<sup>1</sup>.

In June 2011 the Government amended the NES. Part of the amendment changed the target date for achievement of the NES for particle matter smaller than 10 microns (PM<sub>10</sub>).

The current operative Nelson Air Quality Plan is predicated on complying with the NES air quality standard for PM<sub>10</sub> by 1 September 2013, as was required by the NES prior to its amendment and at the time the Air Quality Plan was finalised. Compliance in the current Air Quality Plan means not more than 1 exceedance per year of the PM<sub>10</sub> standard of 50µg.m<sup>-3</sup>, measured as a 24 hour average.

The current Air Quality Plan includes rules that phase out the use of all domestic open fires, and, depending on the airshed concerned (air catchment), many of the enclosed burners that existed at the time the Air Quality Plan was notified in August 2003. All open fires in urban Nelson had to cease operation by 1 January 2008. For enclosed burners in Airsheds A and B a series of phase-out dates were mandated. These targeted the oldest group of burners first (by 1 January 2010), the next group by 1 January 2012, and the final cohort (installed in the period 2000-2003) by 1 January

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<sup>1</sup> Resource Management (National Environmental Standards for Air Quality) Regulations 2004 (SR2004/309)

2013. The rule phasing out use of burners installed 2000-2003 applies only in Airshed A and B1. This is because the severity of the pollution levels and/or the mix of pollution sources required accelerated replacement of these burners in order to achieve the PM<sub>10</sub> standard by the date specified in the original NES (2013).

In Airshed, C where PM<sub>10</sub> levels were lower, a less regulatory approach was possible. Mandatory phase out of enclosed burners was not necessary as 'natural attrition', i.e. natural replacement, of these burners was sufficient to achieve the PM<sub>10</sub> air quality standard.

The effect of the amended NES is that for more contaminated airsheds, like Nelson's Airsheds A and B, a two step regime for compliance with the PM<sub>10</sub> standard has been introduced. By 1 September 2016 there must be not more than 3 exceedances per year through to 31 August 2020, and from 1 September 2020 onwards not more than one exceedance per year.

This Plan Change proposes to:

- i) Amend the target dates for compliance with the NES in Policy A5-1.4 to align them with the new NES dates, and
- ii) Remove the clause in rule AQr.24.1 that requires use to cease of those domestic burners in Airsheds A and B1 installed after 1 January 2000 and which are not compliant with the emission requirements in the Air Quality Plan.

The reasons for proposing to remove the mandatory phase-out rule for 'non-clean air' burners installed from 1 January 2000 to August 2003 (when the Air Quality Plan was notified) are as follows:

- This group of burners installed 2000-2003 is relatively modern and much cleaner burning than burners installed in the 1970s, 80s and even 90s.
- Mandated replacement or stopping of use cannot be justified in terms of reductions in emissions needed to meet the revised NES, - neither the 2016 target nor the 2020 one. 'Natural attrition' of these burners over time will achieve the required air quality improvements.
- Removing this group of burners produces 'diminishing returns'. That is, some of the burners are very close to complying with the current woodburner standards in the Air Quality Plan/NES. Limited improvement in air quality is gained by replacing such burners with NES-compliant ones.
- A burner installed in 2003 would only be 9 years old when removed - about half way through its recommended life. That can be justified if removal is absolutely necessary to meet the target, but if it is not necessary, then it is not justifiable.
- With compulsory replacement, comes the need for financial assistance to avoid hardship and, in the case of a relatively modern burner, to help compensate for replacement before the end of its economic life. There is a significant cost to the ratepayer from the Clean Heat-Warm Homes assistance scheme. If mandatory replacement is not necessary, the Clean Heat-Warm Homes scheme can be ended a year earlier (June 2012 compared to June 2013).

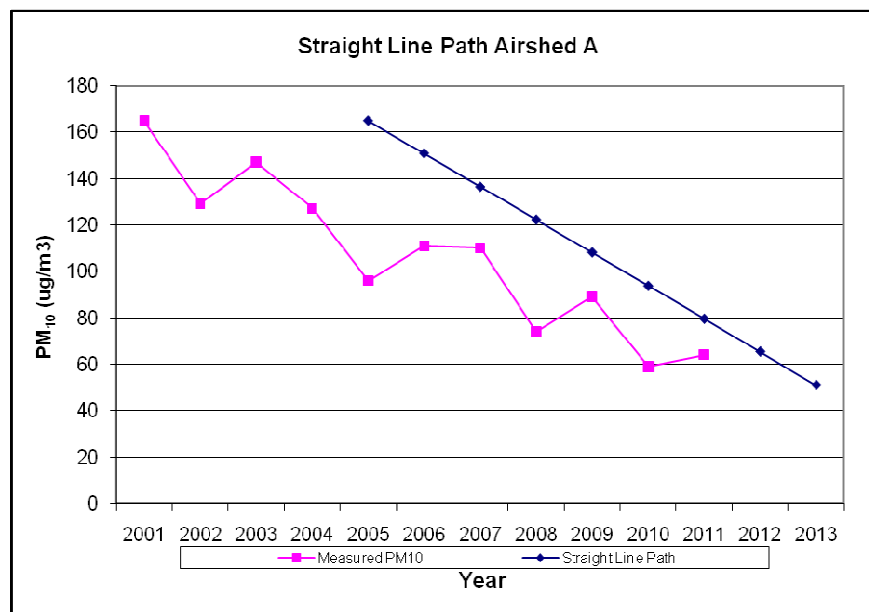
The replacement of some of the burners installed in the years 2000-2003 is still necessary to achieve the ultimate NES target of one exceedance by 2020. However, 'natural attrition' is sufficient to achieve this. This occurs as some of the burners are replaced with more modern burners or with cleaner heating alternatives when they wear out, the home owners renovate or their needs change.

Achieving full NES compliance more slowly - by 2020 instead of the original date of 2013 - will have effects on human health. In Nelson's case the impact will be small.

That is because the city already is well along the way towards meeting the NES standard. The bulk of the human health gains have been secured already. The remainder will come with the phasing out of the next group of burners due at the end of 2012, and with the voluntary replacement or upgrading of some of the burners installed since 2000. This is discussed further in section 2.2.2 of this report.

As shown in the graph below for Airshed A (Hospital Valley, Victory, Washington Valley), there has been a significant improvement in PM<sub>10</sub> levels. Peak measured levels have trended down comfortably below the straight line path required by the previous version of the NES.

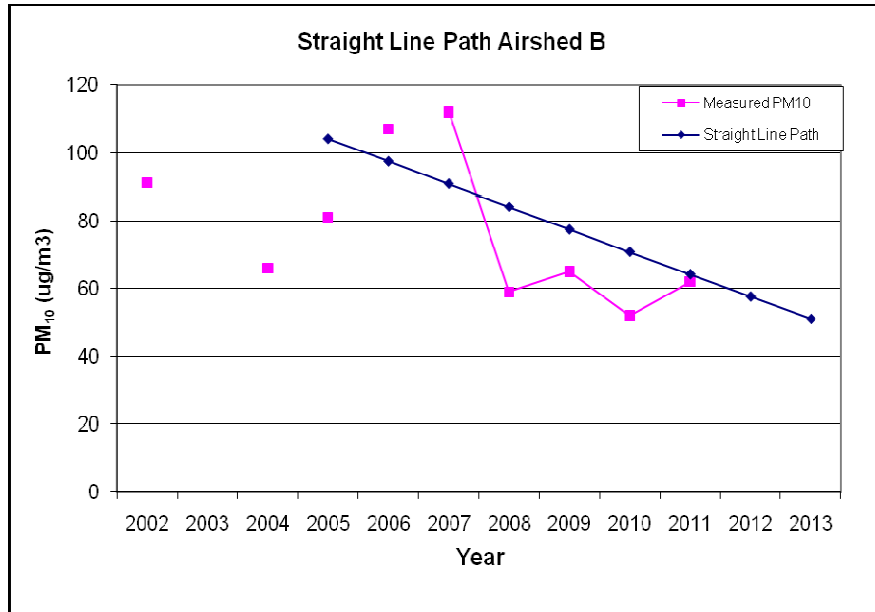
As the concentration of pollution has fallen, so too has the number of times the air standard has been breached in any year. Exceedances have fallen from the 81 in 2001, to 51 in 2005, to 34 in 2009. In 2010 there were 7 breaches, but 2010 was a reasonably mild winter. To date in 2011 there have been 15 breaches, with a highest reading of 64µg.m<sup>-3</sup> compared to 59µg.m<sup>-3</sup> in 2010.



The trend is less clear in Airshed B (Tahunanui, Wakatu, Stoke- see graph next page), partly because of problems with the continuity of the data. Unfortunately the data over the years comes from monitoring stations at different locations<sup>2</sup>, but since 2007 there has been continuous monitoring at Blackwood St.

Over the last four years the maximum concentrations of PM<sub>10</sub> at the Blackwood St site have fluctuated between 52µg.m<sup>-3</sup> and 65µg.m<sup>-3</sup>. The number of exceedances was 11 and 8 in 2008 and 2009, and one in each of 2010 and 2011. The last two years would comply with the NES ultimate target of one exceedance in any 12 month period. However, given the short period of quality data from the Blackwood St monitoring site, it is not clear how representative this is, and whether this could be sustained without further initiatives to reduce discharge levels into this airshed.

<sup>2</sup> 2002, 2004 – Roto St; 2005 – Roto St/Vivian Pl; 2006 – Vivian Pl; 2007 onwards Blackwood St.



A significant further improvement in air quality is expected to be seen in both airsheds over the winter of 2012, due to the compulsory phase out at the end of 2011 of over 700 burners. With those burners being replaced, and 'natural attrition' of other burners, air quality is expected to achieve not more than 3 breaches of the standard by 1 September 2016, and not more than one exceedance by 1 September 2020.

Computer modelling (Appendix 1) supports this proposed Plan Change removing the mandatory phase-out rule for those burners installed in the 2000-2003 period as the ultimate NES target for PM<sub>10</sub> (not more than one exceedance in and after 2020) can be achieved without compulsory phase-out of this group of burners. The natural cycle of replacement of these burners (and others) is forecast to be sufficient to ensure compliance with the NES.

## **2.0 Appropriateness in achieving the purpose of the RMA**

### **2.1 Evaluation of the objective(s) – the environmental outcome to be achieved**

Section 32 requires an evaluation of the extent to which the objective is the most appropriate way to achieve the purpose of the RMA.

No new objectives are being proposed, and none of the proposed changes amend the single operative objective of the Air Quality Plan. Objective A5-1 is *The maintenance, and the enhancement where it is degraded, of Nelson's air quality, and the avoidance, mitigation or remediation of any adverse effects on the environment of localised discharges into the air.*

The existing objective meets the purpose of the Act and the NES. No further assessment as regards the objective is considered necessary.

### **2.2 Whether the policies, rules, or other methods are the most appropriate for achieving the objective in terms of their efficiency and effectiveness, benefits and costs, and in regards to the risk of acting or not acting**

#### **2.2.1 Introduction**

The tables below provide an evaluation of the costs and benefits of the proposed Plan Change and whether each is the most appropriate method for achieving the Plan's objective, having regard to their efficiency and effectiveness.

Costs and benefits have largely been assessed subjectively and/or comparatively because of the great difficulty in assessing/quantifying intangible costs e.g. cultural costs. In some cases quantitative assessments of costs have been given.

The concept of risk has two dimensions, the probability of something adverse occurring and the consequence of it occurring. For example, if there is low risk associated with acting but high risk associated with not acting, then taking action is clearly the sensible thing to do. Risk is usually expressed as 'probability' multiplied by 'consequence' and associated with a cost – usually a severe economic, social or environmental cost. Assessing the risk of acting or not acting means assessing the probability of a cost occurring and the size of that potential cost.

#### **2.2.2 Part a) - Policy A5-1.4**

Section 44A(7) and (8) of the RMA require every local authority and consent authority to observe national environmental standards and to enforce the observance of them to the extent of their powers.

Policy A5-1.4 (Fine Particle Pollution) sets a target date of 1 September 2013 for compliance with the 24-hour mean NES value for PM<sub>10</sub><sup>3</sup>. That date reflected the requirement set in the NES as it was originally promulgated in 2004.

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<sup>3</sup> Particle matter less than 10 micrometres in diameter

The 2011 amendments to the NES moved the compliance target date applying to cities such as Nelson, to 1 September 2020, and with a 'waypoint' in 1 September 2016 when not more than 3 exceedances per year are permitted.

The target date in Policy A5-1.4 currently is therefore more stringent than the new target date(s) in the amended NES.

Objectives and policies in the plan can be more stringent than an NES, and rules can be more stringent if an NES expressly allows (which the air quality NES does).

A local authority is not legally required to change its regional plan to bring it into line with the revised air NES if its provisions are more stringent, but it is if the rules are less stringent.

The broad alternative options regarding PM<sub>10</sub> targets in policy are:

1. Option 1 – Status Quo - do not proceed with the Plan Change. Leave the dates in Policy A5-1.4 for compliance with the PM<sub>10</sub> 24h standard as they are i.e. by September 2013.
2. Option 2 – Amend the Plan to align the targets in the policy with the September 2020 targets (and the 2016 mid point target) in the amended NES.
3. Option 3 – Amend to Plan so the target dates in the policy are at some point between 2013 and the new NES 2020 target.

All of the above options would comply with the RMA.

In terms of RMA section 32 however a local authority needs to consider whether, having regard to their efficiency and effectiveness, the policies, rules or other methods are the most appropriate for achieving the objective(s) of the plan (s32(3)). Account must be taken of benefits and costs, and the risk of acting or not acting if there is uncertain or insufficient information.

In accordance with s32 these alternative options are assessed in Table 1.

**Table 1 Policy A5-1.4**

	<b>Option 1 - Status Quo – leave compliance date at 2013</b>	<b>Option 2 – Amend target dates in policy to align with new NES targets</b>	<b>Option 3 – Amend target dates in policy somewhere between existing and new NES target dates</b>
<b>Benefits</b>	<p><u>Economic</u> Small financial saving from not having this Plan Change, and subsequent share of reporting, hearing etc costs.</p> <p>Achieving health benefits earlier has economic benefits (reduced sickness, hospital costs, extended life/early death avoided).</p> <p><u>Environmental</u> Air quality would comply fully by 2013 with NES (one exceedance in a year of the 50µg.m<sup>-3</sup> standard for PM<sub>10</sub>). Therefore health benefits for people living and working in</p>	<p><u>Economic</u> Significant economic benefits to businesses, homeowners and the Council in a slower timetable for compliance. A longer period to achieve compliance allows other options, including less regulatory, less costly options. As discussed in Table 3, the forced phase-out of burners installed 2000-2003 could be abandoned. This group of about 720 burners are relatively modern – they have many years of economic life left in them, and are relatively</p>	<p><u>Economic</u> As for option 2, but the economic benefits would be smaller. If a compliance date earlier than 2020 were set – say 2017– then the ability to move away from a strict compulsory phase-out is reduced and may not be possible. In the latter case, most of the economic benefits would be lost. There would be small benefits to businesses seeking PM<sub>10</sub> discharge consents.</p> <p><u>Environmental</u> Similar to option 2, but as</p>

	<b>Option 1 - Status Quo – leave compliance date at 2013</b>	<b>Option 2 – Amend target dates in policy to align with new NES targets</b>	<b>Option 3 – Amend target dates in policy somewhere between existing and new NES target dates</b>
	the city are achieved sooner.	<p>clean burning compared to burners installed in the 1970s, 80s and 90s. Replacing this group of burners costs the same as for older burners, but produces 'diminishing returns' in terms of air quality benefits i.e. there are less 'bangs for the buck'. A longer timeframe allows the option for such burners of relying on natural turnover and replacement. This approach is cost neutral and can achieve the NES standard and the timeframes.</p> <p>Due to the ability to remove the requirement to compulsory replace the 2000-2003 group of burners, Option 2 is economically much better than Option 1 for all concerned. Homeowners can upgrade to a cleaner burner, or some other form of heating at a time they would otherwise have chosen. There is no additional cost to them as it is part of normal refurbishment. Because there is no compulsion or carrot needed, the Council and the ratepayer do not have to provide financial assistance. Savings to the ratepayer of approximately \$1.2m are achievable<sup>4</sup>. Private savings are additional to that (approx \$4200 per affected household), but much of this is spending deferred rather than an absolute saving. This is consistent with the scale of costs and benefits in the analysis accompanying the Government's proposed amendments to the NES. The Government's analysis showed that under the slower timetable, health benefits reduce slightly from \$1911 million to \$1746 million, but the economic costs of</p>	above, benefits may be less certain.

<sup>4</sup> Being the cost of the interest-free loan per burner (720 burners x \$1500) plus the costs of running the Clean Heat-Warm Homes scheme)

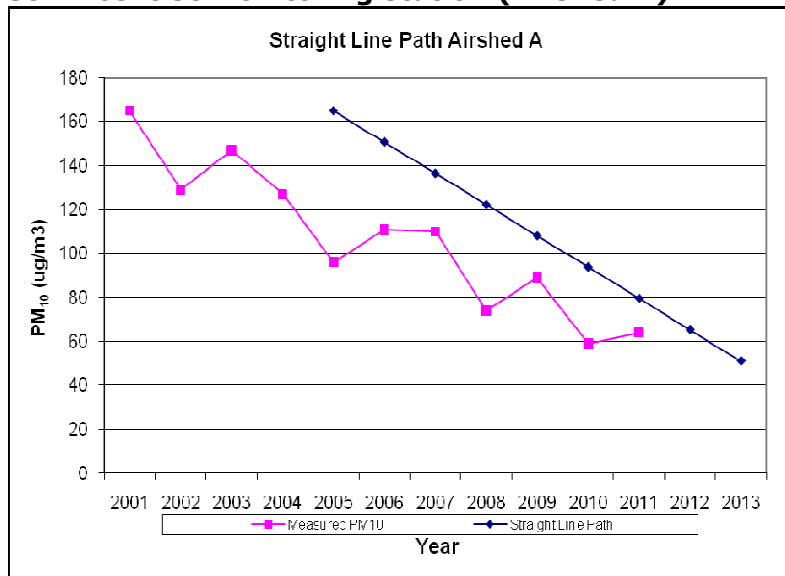


	<b>Option 1 - Status Quo – leave compliance date at 2013</b>	<b>Option 2 – Amend target dates in policy to align with new NES targets</b>	<b>Option 3 – Amend target dates in policy somewhere between existing and new NES target dates</b>
		<p>compliance fall from \$867 million to \$196 million.</p> <p><u>Environmental</u> Allowing relatively modern burners to see out their economic life reduces wastage and resources going to recycling early.</p>	
<b>Costs</b>	<p><u>Economic</u> Significant economic cost to businesses, homeowners and the Council in achieving full compliance earlier. Affected businesses and homeowners have to upgrade earlier than they would under amended NES timetable. Achieving early compliance requires rules to mandate ending the use of domestic burners by specified dates. When a homeowner is forced to stop using their burners ahead of its normal life, then issues of compensation and/or financial assistance for replacement arise.</p> <p>Council provides financial assistance under its Clean Heat-Warm Homes scheme (CHWH) to any homeowner whose burner is affected by a mandatory phase-out rule. This is in the form of an interest-free 'loan', the interest on which costs the ratepayer about \$1500 per burner, or higher if the person is in receipt of a rates rebate. On top of this are staff and administration costs of running the scheme.</p> <p>For those who do not wish to use the CHWH scheme, all costs are borne privately. While these are costs that the homeowner would have faced eventually when the burner needed replacing, the expenditure is advanced considerably.</p> <p><u>Environmental</u> There is an environmental cost involved in replacing burners before the end of their functional life. Removed burners are</p>	<p><u>Economic</u> Small financial cost of undertaking this part of the Plan Change, and subsequent share of reporting, hearing etc costs.</p> <p><u>Environmental</u> The environmental cost in achieving the air quality standard for PM<sub>10</sub> more slowly than under Option 1 relates to delaying health benefits. However, as noted under Option 1 (and Fig 1 &amp; 2), most of the health gains have already been achieved. The environmental cost of achieving the last 10-12% of health benefits over a longer timeframe is small. This is especially the case because the first PM<sub>10</sub> target needs to be met by 2016 – only 3 years later than the current target. The gains through further improvement from 2016 to 2020 are proportionally very small.</p>	<p><u>Economic</u> Small financial cost of undertaking this part of the Plan Change, and subsequent share of reporting, hearing etc costs.</p> <p><u>Environmental</u> Similar arguments to option 2, but the environmental costs would be slightly smaller if the compliance dates were earlier than in the NES.</p>

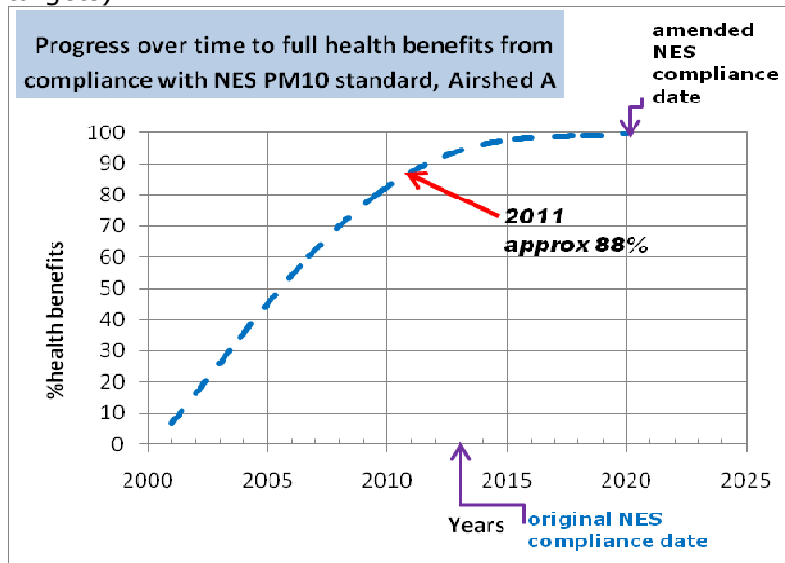
	<b>Option 1 - Status Quo – leave compliance date at 2013</b>	<b>Option 2 – Amend target dates in policy to align with new NES targets</b>	<b>Option 3 – Amend target dates in policy somewhere between existing and new NES target dates</b>
	recycled for scrap which reduces these impacts to some degree.		
<b>Benefit and Costs Summary</b>	The status quo option has environmental benefits that outweigh the environmental costs. But these environmental benefits come at a significant economic cost.	Option 2 has significant positive economic benefits. There are environmental costs in terms of health benefits achieved more slowly, but this effect is relatively minor since the substantive health benefits from improved air quality have already been achieved.	Option 3 (extending the compliance dates less than in NES) runs the risk of not delivering economic benefits of any substance. Environmental costs are smaller than Option 2. The cost:benefit ratio (from best to worst) is Option 2 > Option 3 > Option 1.
<b>Effectiveness and Efficiency</b>	<p>The status quo option is an effective way of meeting the objective of the Air Quality Plan (improving air quality where it is degraded, and allowing good quality air to not degrade). However, it is not particularly efficient. The environmental benefits come at a high economic cost.</p> <p>Remaining with a 2013 target is very effective in that the health (and associated economic benefits) of reaching the PM<sub>10</sub> standard and cleaner air are achieved much sooner. Figure 1, which follows this table, shows the actual improvement in PM<sub>10</sub> concentrations at the St Vincent St monitoring site since measurements commenced in 2001. Figure 2 (also after table) uses this data to calculate a trendline for the percentage health benefits achieved (with 100% being the benefits from full compliance with the 50µg.m<sup>-3</sup> NES level).</p> <p>Figure 2 shows there is a diminishing return in terms of effectiveness. Close to 90% of the health improvements have been achieved already in Airshed A. It is then a case whether the remaining benefits (to achieve the 50µg.m<sup>-3</sup> standard) are achieved over 9 years as opposed to over 2 years. The main benefits have to be achieved by 2016, so the better comparison is achieving the remaining</p>	<p>Option 2 is an efficient and effective way to address the operative issues and achieve the objectives.</p> <p><u>Efficiency</u> Amending the policy targets to match the 2016 and 2020 dates in the NES is economically efficient. It allows a move away from compulsory removal of the last cohort of burners that do not meet modern emissions standards. This allows more efficient use of the functional life of these burners. It reduces the private and public financial costs of early replacement.</p> <p>Therefore it is an efficient way of achieving the Air Quality Plan's objective and the mandatory NES target.</p> <p><u>Effectiveness</u> This option is effective in achieving the air quality objective. The NES standard will still be achieved albeit more slowly (discussed further in Table 3).</p>	<p>Because of the uncertain economic benefits, Option 3 is not particularly effective, or efficient.</p>

	Option 1 - Status Quo – leave compliance date at 2013	Option 2 – Amend target dates in policy to align with new NES targets	Option 3 – Amend target dates in policy somewhere between existing and new NES target dates
	gains over the next 5 years versus 2 years.		
<b>Risk of Acting or Not Acting if there is uncertainty or insufficient information</b>	Nelson City has very good monitoring and other data to support its air quality programme. The air quality improvement being seen in the monitoring data matches closely the forecasts when the Air Quality Plan was being considered and options developed. Uncertainty or insufficient information is not an issue.	Not applicable (see option 1)	Not applicable (see option 1)
<b>Conclusion</b>		<b>This option is the most appropriate for achieving the objective.</b>	

**Figure 1: PM<sub>10</sub> maximum concentrations (24-h average) 2001 to 2011, St Vincent St monitoring station (Airshed A):**



**Figure 2: Trendline of progress towards health benefits from full compliance with NES PM<sub>10</sub> standard** (using data from Figure 1 and NES targets)



### 2.2.2.1 Discussion relating to Figures 1 and 2

There is a direct relationship between higher PM<sub>10</sub> concentrations and greater health impacts<sup>5</sup>. Using the better long-term monitoring data from Figure 1, it is possible to develop a graph of 'health gains' over time – both the gains so far, and the projected future gains when compliance with the 2016 and 2020 dates in the NES is achieved.

In Figure 2 the PM<sub>10</sub> concentration in 2001 for Airshed A is taken as the starting point – essentially zero health gains. Full achievement of the PM<sub>10</sub> standard in 2020 will be 100% of the health gains. Actual measured PM<sub>10</sub> concentrations in-between are set as proportions of this and a smoothed line fitted.

Figure 2 shows the bulk of the health gains have been secured. The remainder will come with the phase out of the next group of burners due at the end of 2012, and with the voluntary replacement or upgrading of some of the burners installed since 2000 being proposed in this Plan Change.

<sup>5</sup> *Health Effects of Suspended Particulate – Risk Assessment for Nelson City*, Environet for Nelson City Council, February 2002

*Health and Air Pollution in New Zealand*, Fisher et al, June 2007

### 2.2.3 Part b) - Rule AQr.24

Under the current Nelson Air Quality Plan, achievement of the 2013 target in Policy A5-1.4 is largely implemented by various provisions in rule AQr.24.1. These set the compulsory phase-out dates for open fires, and for certain age classes of enclosed burners. The phase-out rules apply to fires and burners that were in place at the time the proposed Air Quality Plan was notified in August 2003. There is a 'grandparenting' right for such fires and burners – they can be replaced, if the owner wishes, with a compliant burner (on Nelson City Council's approved burner list) provided the building consent to do so is applied for before the phase-out date for the current fire or burner.

Which burners the phase-out rules apply to depends on the nature of the airshed concerned. It relates to the initial pollution levels and the source of the discharges (e.g. the amount that is from domestic houses compared to industry).

Airsheds A and B1 require the largest reductions in domestic emissions. In these areas the current Air Quality Plan requires all fires and burners that were in place prior to August 2003 to be replaced progressively. Older age cohorts have gone first – e.g. open fires by 1 January 2008, pre 1996 burners ('oldest burners') by 1 January 2010, 1996-1999 burners ('middle aged') by 1 January 2012, and the more modern burners last (installed 2000-2003) by 1 January 2013.

This phasing is because earlier model burners tend to produce more PM<sub>10</sub> than later, improved models, and give the largest gains in terms of PM<sub>10</sub> reduction.

In Airshed B2, modelling showed that only burners installed prior to 1996 needed mandatory replacement. The remaining improvements to achieve the PM<sub>10</sub> standard in this airshed could come from natural attrition /replacement of the post 1995 burners.

In Airshed C mandatory phase-out applied to open fires, but mandatory phase-out of burners was not necessary to achieve the air quality target. The target could be achieved as burners were replaced under natural attrition – burners wearing out, refurbishment of houses, or changes in homeowners' heating preferences.

Considerable computer modelling was done during the development of the Air Quality Plan, when a wide range of options was canvassed<sup>6</sup>. Based on that modelling the following can be concluded:

**Table 2:**

Phase-out requirement	Analysis against original and amended NES	
	Original NES	Amended NES
Open fires (1 Jan 2008)	Needed for NES 2013 target	Needed for NES 2016 target
Oldest burners (1 Jan 2010)	Needed for NES 2013 target	Needed for NES 2016 target
'Middle aged' burners (1 Jan 2012)	Needed for NES 2013 target	Needed for NES 2016 target (very high risk of missing target if mandatory phase-out rule dropped)

<sup>6</sup> See Appendix 1. Also *Implications of National Environmental Standards on Air Plan for Nelson*, Emily Wilton, Environet Ltd, March 2005

Burners installed 2000-2003 in Airshed A and B1 (1 Jan 2013)	Needed for NES 2013 target	<u>Not</u> needed for NES 2016 target (3 breaches_) <u>Not</u> needed for 2020 target (1 breach)
'Jetmaster-type' open fires (all of urban area) (end of 2012)	Needed for NES 2013 target	Fairness and consistency issue compared to other open fires which have all been phased out. Recommended rule stays. Small number, little impact on air quality. But are more polluting than woodburners that have had to be replaced.

Analysis of that modelling shows that the first new target that the city must achieve (in 2016, 3 allowable breaches) would be impossible to achieve without the mandatory phase-out of fires and burners that has already occurred.

In addition, to be confident of meeting the 2016 target, the phase-out rule for 'middle aged' burners of 1 January 2012 needs to remain in place. Without the mandated replacement of those burners, air quality will only slowly improve due to 'natural attrition' of these burners. At 15 breaches for the winter of 2011, current air quality in Airshed A is still well above the three required by 2016. Put another way, removing the mandatory 1 January 2012 phase-out rule is not a viable option for giving effect to the proposed new target dates in Policy A5-1.4, and is not assessed further (i.e. it is not effective, and is not an appropriate method).

The situation is different for the last group of burners mandated for phase-out in the Air Quality Plan. That is, burners in Airsheds A and B1 installed between the year 2000 and the end of 2003, which have to be replaced or cease use by 1 January 2013.

Their phase-out had to be forced by a rule at the time the current Air Quality Plan was finalised for timing purposes – that is, to get the benefits of phase-out in time for the September 2013 target in the original NES, and as reflected in the Air Quality Plan. With a longer timeframe to achieve compliance, there is more opportunity for natural replacement, i.e. non-regulatory rather than forced replacement, which would occur as homeowners renovate, burners wear out or heating preferences change.

On this basis the viable options for further assessment are:

1. Option 1 – Status Quo - do not change the rule in the Plan. Leave the phase-out dates in Rule AQr.24.1 as they are (note: rules in the air plan can be stricter than the NES).
2. Option 2 – Amend the Plan to remove the last phase-out date for enclosed burners i.e. by end of 2012 for burners installed 2000-2003 and which do not meet clean air standards in the Plan and NES.
3. Option 3 – Amend the Plan to extend the last phase-out date for enclosed burners to end of 2015 (ahead of the first NES compliance target in 2016).

**Table 3 Rule AQR.24**

	Option 1 - Status Quo – leave phase-out dates unchanged	Option 2 – Delete phase-out date for burners installed 2000-2003 (Airshed A & B1)	Option 3 – Extend to end of 2015 phase-out date for burners installed 2000-2003 (Airshed A & B1)
<b>Benefits</b>	<p><u>Economic</u> Small financial saving from not having this Plan Change, and subsequent share of reporting, hearing etc costs.</p> <p>Earlier health benefits have economic benefits (reduced sickness, hospital costs, extended life/early death avoided).</p> <p><u>Environmental</u> Air quality would comply fully by 2013 with NES (one exceedance in a year of the 50µg.m<sup>-3</sup> standard for PM<sub>10</sub>). Therefore health benefits for people living and working in the city are achieved sooner.</p>	<p><u>Economic</u> Significant economic benefits to homeowners and the Council in removing the mandatory phase-out rule for burners installed in the 2000-2003 period. This group of burners are relatively modern – they have many years of economic life left, and are relatively clean burning compared to burners installed in the 1970s, 80s and 90s. Replacing this group of burners costs the same as for older burners, but produces ‘diminishing returns’ in terms of air quality benefits i.e. there are less ‘bangs for the buck’.</p> <p>Allowing these burners instead to gradually be replaced with a compliant burner, or with some other cleaner option, as part of natural attrition, is much more economically efficient. This approach is cost neutral and can achieve the NES standard and timeframe. It is economically much better than option 1 for all concerned. Homeowners can upgrade to a cleaner burner, or some other form of heating at a time of they would otherwise have chosen. There is no additional cost to them as it is part of normal refurbishment. Because there is no compulsion or carrot needed, the Council and the ratepayer do not have to provide financial assistance. Savings to the ratepayer of approximately \$1.2m are achievable. In addition, homeowners’ capital costs of replacement can be deferred.</p> <p>The disparity of the cost compared to the small benefits is consistent with scale of costs and benefits in the analysis accompanying the Government’s proposed amendments to the NES. According that analysis, under the slower timetable,</p>	<p><u>Economic</u> The economic benefits would be smaller than Option 2, and possibly neutral. Extending the ‘life’ of burners by 3 years would defer, but not eliminate the private costs. It would increase the public costs as the CHWH scheme would have to run for a further 3 years. Although the scheme would be processing fewer houses per year, the annual overheads of the scheme are reasonably high.</p> <p><u>Environmental</u> Allowing relatively modern burners to remain for a further 3 years reduces wastage and resources going to scrap, but less so than Option 2.</p>

	<b>Option 1 - Status Quo – leave phase-out dates unchanged</b>	<b>Option 2 – Delete phase-out date for burners installed 2000-2003 (Airshed A &amp; B1)</b>	<b>Option 3 – Extend to end of 2015 phase-out date for burners installed 2000-2003 (Airshed A &amp; B1)</b>
		<p>health benefits nationally reduce slightly from \$1911 million to \$1746 million, but the economic costs of compliance fall from \$867 million to \$196 million.</p> <p><u>Environmental</u> Allowing relatively modern burners to see out their economic life reduces wastage and resources going to scrap.</p>	
<b>Costs</b>	<p><u>Economic</u> Significant economic cost to homeowners and the Council in achieving early compliance. Because affected homeowners are obliged to phase-out their burners ahead of their normal life, issues of compensation and/or financial assistance for replacement arise. Under the CHWH scheme this costs the ratepayer about \$1500 per burner, or higher if the person is in receipt of a rates rebate. On top of this are staff and administration costs of running the scheme. The CHWH programme to replacement burners installed 2000-2003 in Airsheds A &amp; B1 would cost ratepayers about \$1.2m.</p> <p>This does not include private cost, as even under CHWH most homeowners have to pay back the capital cost, which typically averages about \$4200.</p> <p>For the approximately 720 burners affected by the end of 2012 phase-out, the total cost is estimated to be \$4.2m (including Council costs of \$1.2m).</p> <p>While some of this includes costs the homeowner would have faced eventually on their own account when the burner needed replacing, the expenditure is being advanced considerably.</p>	<p><u>Economic</u> Small financial cost of undertaking this part of the Plan Change, and subsequent share of reporting, hearing etc costs.</p> <p><u>Environmental</u> The environmental cost in achieving the air quality standard for PM<sub>10</sub> more slowly than under Option 1 relates to delaying health benefits. As noted under Option 1 (and Fig 1 &amp; 2), however, the vast bulk of the health gains have already been achieved. The environmental cost of achieving the last 10-12% of health benefits over a slightly longer timeframe is small. This especially the case in that substantial compliance with the PM10 standard is needed by 2016, and the gains through further improvement from 2016 to 2020 are proportionally quite small.</p>	<p><u>Economic</u> Small financial cost of undertaking this part of the Plan Change, and subsequent share of reporting, hearing etc costs.</p> <p>Extending the 'life' of burners by 3 years (relative to Option 1) would defer, but not eliminate the private costs. It would increase the public costs as the CHWH scheme would have to assist more or less the same number of households but over a longer period run for a further 3 years. Although the scheme would be processing fewer houses per year, the annual overheads of the scheme are reasonably high.</p> <p><u>Environmental</u> Similar arguments to option 2, but the environmental costs would be less than in Option 2</p>



	<b>Option 1 - Status Quo – leave phase-out dates unchanged</b>	<b>Option 2 – Delete phase-out date for burners installed 2000-2003 (Airshed A &amp; B1)</b>	<b>Option 3 – Extend to end of 2015 phase-out date for burners installed 2000-2003 (Airshed A &amp; B1)</b>
	<p><u>Environmental</u> There is an environmental cost involved in replacing burners before the end of their functional life. This is especially the case for the last group of burners affected by mandatory phase-out. Those are those installed 2000-2003. A burner installed in 2003 would only be 9 years old when the phase-out rule forced it to cease use or be replaced. Burners typically are replaced, on average, after about 18 years, although some burners are used in excess of 30 years. Removed burners are recycled for scrap which reduces these impacts to some degree.</p>		
<b>Benefit and Costs Summary</b>	<p>The status quo option has environmental benefits that outweigh the environmental costs. But these benefits come at a significant economic cost.</p>	<p>Option 2 has significant net economic benefits. There are environmental costs in terms of health benefits achieved more slowly, but this effect is relatively minor since the substantive health benefits from improved air quality have already been achieved.</p>	<p>Option 3 (extending the 2000-2003 burner phase-out rule by 3 years) runs the risk of not delivering economic benefits of any substance, mainly because of the costs of maintaining the CHWH scheme for the longer period. The net environmental benefits (relative to Option 2) are very small. It is not clear whether net benefits would be greater than under Option 1. They would be substantially less than Option 2.</p>
<b>Effectiveness and Efficiency</b>	<p>The status quo option is an effective way of meeting objective of the Air Quality Plan (improving air quality where it is degraded, and allowing good quality air to not degrade). However, it is not particularly efficient. The environmental benefits come at a reasonably high economic cost. <u>Efficiency</u> The rule for compulsory phase-out of burners at the end of 2012 was put into the current Air Quality Plan to achieve compliance with the NES as it was at the time.</p>	<p>Option 2 is an efficient and effective way to address the operative issues and achieve the objectives. <u>Efficiency</u> Removing the phase-out rule for burners installed 2000-2003 is economically efficient. It allows more efficient use of the functional life of these burners. It reduces the private and public financial costs of early replacement. Therefore it is an efficient way of achieving the Air Quality Plan's objective and the mandatory NES target.</p>	<p>Option 3 is effective, but not very efficient. <u>Efficiency</u> Extending the phase-out rule for burners installed 2000-2003 is not considered to be efficient. It does allow more efficient use of the economic life of these burners, and reduces the private costs of early replacement. However, because it requires CHWH to run at a low rate, for a longer period, there are substantial public costs. <u>Effectiveness</u> This option is effective in</p>

	<b>Option 1 - Status Quo – leave phase-out dates unchanged</b>	<b>Option 2 – Delete phase-out date for burners installed 2000-2003 (Airshed A &amp; B1)</b>	<b>Option 3 – Extend to end of 2015 phase-out date for burners installed 2000-2003 (Airshed A &amp; B1)</b>
	<p>Even then it was known that achieving such an early target was not very economically efficient. It is difficult to justify the estimated \$4.2m cost of retaining the phase-out rule, for the very small acceleration in the rate of air quality improvement.</p> <p><u>Effectiveness</u>            Remaining with an end of 2012 phase-out rule for burners is very effective in that the health (and associated economic benefits) of reaching the PM<sub>10</sub> standard cleaner air are achieved much sooner. Figure 1 shows the actual improvement in PM<sub>10</sub> concentrations at the St Vincent St monitoring site since measurements commenced in 2001. Figure 2 uses this data to calculate a trendline for the percentage health benefits (with 100% being the benefits from full compliance with the 50µg.m<sup>-3</sup> NES level).</p> <p>Figure 2 shows there is a diminishing return in terms of effectiveness. Close to 90% of the health improvements have been achieved already in Airshed A. It is then a case whether the remaining benefits (to achieve the 50µg.m<sup>-3</sup> standard) are achieved over 9 years under the NES, as opposed to 2 years under the status quo. The main benefits have to be achieved by 2016, so the better comparison is achieving the remaining gains over the next 5 years versus 2 years. Because of Nelson’s advance progress on air quality, the speed (effectiveness) of achieving the remaining improvements is not significant.</p>	<p><u>Effectiveness</u>            This option is effective in achieving the air quality objective. The NES standard will still be achieved albeit more slowly.</p>	<p>achieving the air quality objective. The NES standard will still be achieved albeit more slowly.</p>
<b>Risk of Acting or Not Acting if there is uncertainty or insufficient information</b>	<p>Nelson City has very good monitoring and other data to support its air quality programme. The air quality improvement being seen in the monitoring data matches</p>	<p>Not applicable (see option 1)</p>	<p>Not applicable (see option 1)</p>

	<b>Option 1 - Status Quo – leave phase-out dates unchanged</b>	<b>Option 2 – Delete phase-out date for burners installed 2000-2003 (Airshed A &amp; B1)</b>	<b>Option 3 – Extend to end of 2015 phase-out date for burners installed 2000-2003 (Airshed A &amp; B1)</b>
	closely the forecasts when the Air Quality Plan was being considered and options developed. Uncertainty or insufficient information is not an issue.		
<b>Conclusion</b>		<b>This option is the most appropriate for achieving the objective.</b>	

Other options were considered and screened but not taken further. For example, changing the burner phase-out date rule that has effect on 1 January 2012 ('middle aged' burners) was considered, but discarded as a potential candidate. As is noted in Table 2, without mandatory replacement of these burners, compliance with the first NES target would be at risk. The winter of 2011 had 15 exceedances of the NES in Airshed A. If no further interventions occur, there is no reason to expect a rapid change in the number of breaches – certainly not down to 3 or less as required in 2016.

A lesser, but still significant, reason is that even if the NES could still be achieved, such a proposed change would create considerable public uncertainty just a few months ahead of the phase-out. Rules under both the operative plan and the proposed plan change would apply. One would mandate the phase-out – the other might lift it or extend it. Homeowners would have to pay for resource consent applications to continue to use their burners, and even then the final outcome would not be clear. If the proposed Plan Change were eventually rejected by the hearing commissioners, but ahead of that decision many burners were consented to remain in use, then achievement of the NES targets might be compromised.

Removal of the mandatory phase-out date for 'Jetmaster'-style open fires was not considered appropriate. 'Jetmaster'-type appliances fit into open fire places. They do not have a door – they are a form of open fire, not an 'enclosed burner'. Council in its decisions on submissions decided in 2005 to give such fireplaces longer to phase out than conventional open fires – to 1 January 2013.

The small number of these devices (possibly fewer than 20) means that their collective contribution to pollution levels is not great. However, the devices are significantly more polluting than a post 2000 woodburner – potentially 5 to 10 fold higher PM<sub>10</sub> emissions.

In terms of consistency with less polluting devices which have already been phased out, and fairness to the owners of open fires and older enclosed burners who have had to comply, the phase-out for 'Jetmaster'-type fireplaces was not considered further for removal.

One other option was to change the consent category so that use of burners installed in the 2000-2003 period became a discretionary resource consent (as opposed to a prohibited activity). However that would have high consenting costs, and be much less efficient and effective than Option 2.

## Conclusion

The PM<sub>10</sub> target date of 2013 was not in the original Air Quality Plan as notified. It was included because compliance with the NES required it.

Now that 2013 has been replaced in the NES with later 2-stage compliance dates (2016 & 2020), there are more economically and administratively efficient ways of achieving compliance with the PM<sub>10</sub> standard (which in absolute terms remains the same at 50µg.m<sup>-3</sup>).

Changing the compliance dates in Policy A5-1.4 to align them with the amended NES, and to remove the mandatory phase-out rule for burners installed between 2000 and 2003 in Airsheds A & B1 means that health benefits from improved air quality are still achieved, but at a slightly slower rate. Given that the vast bulk of the health benefits from reducing PM<sub>10</sub> levels have already been achieved in Nelson, achieving the last relatively small increment more slowly is not considered to be a significant environmental cost.

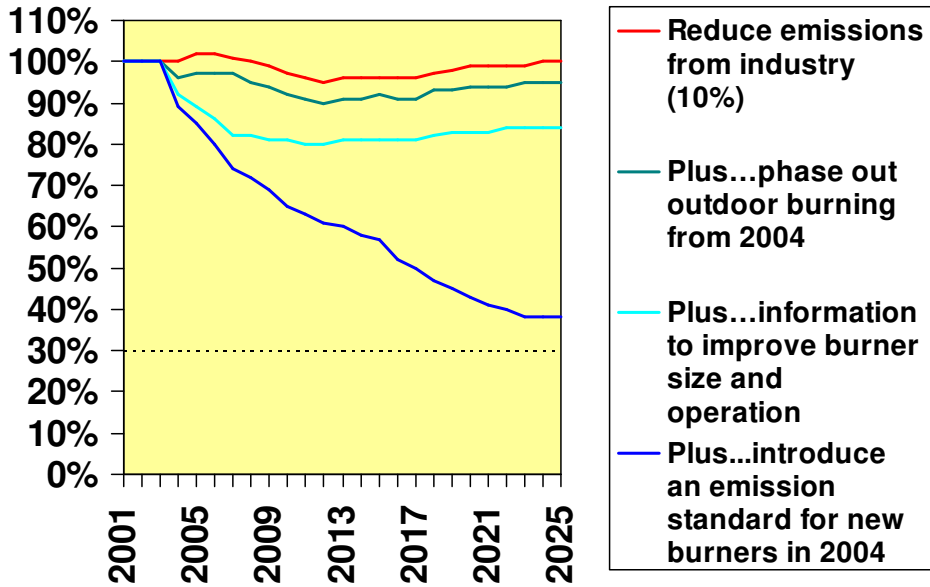
Turning it round the other way, it is very difficult to justify the large economic cost associated with achieving the PM<sub>10</sub> standard at a date earlier than is now required in the NES as there are no regional circumstances that warrant taking a different approach than the standard applying nationally.

### **Supporting and Related Documents:**

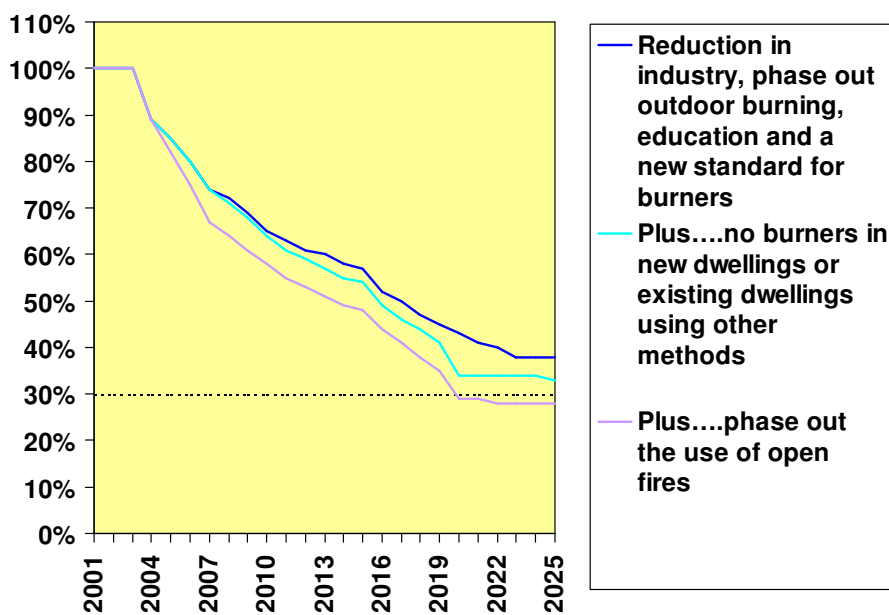
- a) *Clearing the Air – a strategy for change. Discussion document on reducing particle air pollution in urban Nelson, Nelson City Council, November 2002.*
- b) *Improving Air Quality in Nelson – an assessment of the effectiveness of management options for reducing PM<sub>10</sub> concentrations in Nelson: Stage One. Environet for Nelson City Council, May 2002*
- c) *Improving Air Quality in Nelson –management options for reducing PM<sub>10</sub> concentrations: Stage Two. Preliminary comparisons of costs and benefits of achieving Nelson 'clean air' targets by 2020 or 2013. Nelson City Council. July 2002*
- d) *Section 32 Evaluation Report Air Quality Plan, Nelson City Council, August 2003*
- e) *Overview Report to Proposed Nelson Air Quality Plan Hearing Report – Staff analysis of submissions and Preliminary Recommendations, David Jackson, Nelson City Council, April 2005*
- f) *Implications of National Environmental Standards on Air Plan for Nelson, Emily Wilton, Environet Ltd, March 2005*

**Appendix 1 – Modelling of options that in combination achieve NES standard by 2020**

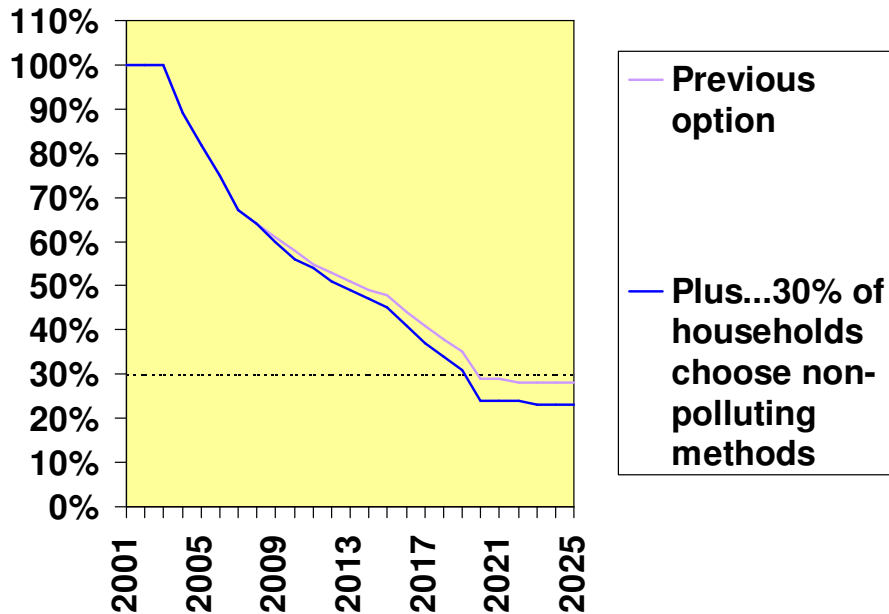
## Combination of options (slide 1)



## Combination of options (slide 2)



## Combination of options (slide 3)



Graphs from section 9, *Improving air quality in Nelson – An assessment of the effectiveness of management options for reducing PM<sub>10</sub> concentrations in Nelson*, Emily Wilton, Environet Ltd, 2002 (Figures 9.1, 9.3 and 9.4)

Assumes 10% reduction of industrial emissions, phase out of outdoor burning 2003, no burners installed in new houses or in older houses without an existing fire or burner, improvements from better operation, sizing of burners, insulation and better wood, a new emission standard for wood burners of 1.5g/.kg introduced 2004, and that open fires and burners are replaced with 1.5g/kg burners – plus the final option that 70% of replacements are with 1.5g/kg burners and that 30% are with non-solid fuel options.

Note:

1. Inclusion of the last option (assuming 30% of households changing fires/burners swap to non-solid fuel heating) achieves the  $50\mu\text{g}\cdot\text{m}^{-3}$  PM<sub>10</sub> standard (shown as 30% of starting value) by 2019 – a year ahead of the ultimate target. By 2020 the estimate line is comfortably below the standard.
2. As at July 2011, 41% of homeowners have chosen non-solid fuel options when open fires and enclosed burners have been replaced under the Clean Heat-Warm Homes programmes.